National Aeronautics and Space Administration
Goddard Space Flight Center

Inside Wallops

Wallops Flight Facility, Wallops Island, Virginia | Volume XX-01 | Number: 02 | January 16, 2001

NASA Balloon Research Rides To The Edge of Space

The countdown is underway for the launch of a revolutionary research-balloon designed to fly higher and longer than anything before it, and the flight could open a new era in scientific research.

NASA's new Ultra-Long Duration Balloon (ULDB) is scheduled to lift off Jan. 20 from Alice Springs, Australia, and will carry the hopes of many scientists who see balloon technology as an economical means of studying the Earth and space.

"Although balloons have been flying for more than 200 years and scientists have long used them for a variety of research missions, the length of time balloons can stay aloft has always constrained their efforts," said Steve Smith, Chief of the Balloon Program Office, NASA Goddard Space Flight Center's Wallops Flight Facility, Wallops Island, VA.

"Thanks to greatly enhanced computer technologies, high-tech materials and advanced designs, longer-range balloons are poised to open a new frontier for high-altitude research".

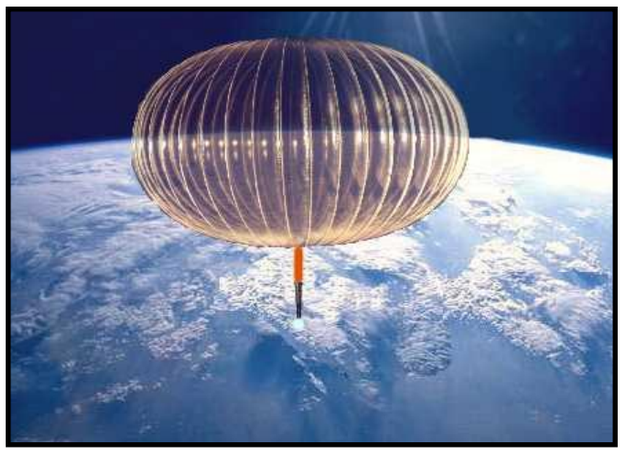
The balloon is expected to float over the Southern Hemisphere at an altitude of approximately 115,000 feet (35 kilometers), 3 to 4 times higher than passenger planes. The balloon will carry an experiment called NIGHTGLOW that was designed for NASA Long duration Balloon.

While the test flight is expected to last only about two weeks and circumnavigate the globe, the ULDB is designed to support missions for up to 100 days.

"Balloons provide cost-effective platforms for near-space observations," said Dr. Vernon Jones, Office of Space Science, NASA Headquarters, Washington, DC. "This January flight provides an excellent opportunity to test the newly designed ULDB system."

The full-scale ULDB is the largest single-cell, super-pressure (fully sealed) balloon ever flown. At launch, the balloon is partially inflated with helium and expands as it rises. When fully inflated, the massive ULDB would barely fit inside a domed football stadium.

The ULDB floats above 99 percent of the Earth's atmosphere and can carry a 3,500-pound (1.588-kilogram) payload. The balloon system comes



down in a controlled descent. It may be visible from the ground with a telescope and, in some cases, with the naked eye.

The ULDB's unique pumpkin-shaped design and its novel material, a lightweight polyethylene film about the thickness of ordinary plastic food-wrap, were successfully tested during a prototype flight from Ft. Sumner, NM, last June.

"Recent development of new balloon materials and associated technologies will enable challenging, important investigations to be done at relatively modest cost," said Jones. He added that the ability to fly balloons for months or years at a time would create a multitude of scientific and business opportunities.

Conventional high-altitude, scientific balloon flights typically last a few days to a week because temperature changes from day to night ultimately cause the balloon to lose altitude.

The ULDB is completely sealed, so gas is not vented to relieve pressure. The new super-pressure balloon will maintain lift, size and shape, and will not lose significant altitude due to atmospheric influences.

The first science mission designed and built for the ULDB will carry the Trans-Iron Galactic Element Recorder (TIGER) instrument and is planned for December 2001 from Antarctica.

The TIGER mission includes investigators from NASA's Goddard Space Flight Center, Greenbelt, Md.; California Institute of Technology, Pasadena; the University of Minnesota, Minneapolis: and Washington University in St. Louis.

The NIGHTGLOW experiment, with upward and downward looking telescopes, is designed to detect background radiation produced by a variety of sources, including moonlight and starlight, the interaction of molecules in the atmosphere and human-made lightning.

NIGHTGLOW, a collaboration between NASA Goddard and the University of Utah, Salt Lake City, will measure the ultraviolet light illuminating the night sky and may ultimately help solve the mystery of high-energy cosmic rays, according to Louis Barbier, Goddard astrophysicist and principal investigator.

Future science missions for the ULDB will study the source of cosmic rays generated from shock waves emanating from supernovae and will perform surveys of X-ray emitting objects in the universe, search for planets around other nearby stars and will study other objects in space, including the Sun.

The Wallops Flight Facility manages NASA's scientific balloon program for the Office of Space Science. Launch operations are conducted by the National Scientific Balloon Facility, Palestine, TX, which is managed for NASA by the Physical Sciences Laboratory of New Mexico State University, Las Cruces. Australian operational support to NASA is provided by the Commonwealth Scientific Industrial Research Organization.

More information on the Ultra-Long Duration Balloon mission and tracking of the balloon flight can be found at: http://www.wff.nasa.gov/pages/scientificballoons.html

NIGHTGLOW information: http://lheawww.gsfc.nasa.gov/docs/gamcosray/hecr/NightGlow/ng.html

Weather Summary

By Ted Wilz, Senior Meteorologist

Although winter didn't officially begin until December 21st, cold temperatures arrived well before the seasonal change. December was an extremely cold month with temperatures averaging just over 7 degrees below normal. Northwesterly winds, which are often the vehicle for cold air coming down from Canada at this time of year, continued to be more common than normal, occurring on 22 days during December, and the temperature actually went below freezing on 27 days.

The coldest portion of the month was at Christmas, as the low temperatures dipped into the teens on each day from Dec. 21-26. None of these were record lows, however; the only record low for the month was the 20 degree reading on the morning of December 5th, eclipsing our previous record of 24 degrees for that date. And even though we had extremely cold temperatures most of the most, we actually did set a new record high temperature with our 61 degree reading on December 17th.

Even though we had part of the ingredients for a White Christmas with our cold temperatures during that period, unfortunately December also continued the dry weather trend that has plagued us in recent months.

Although there were nine days with measurable precipitation during the month, we accumulated only 1.98 inches, much less than our 3.20 inches monthly average. And even though we had snow on four different days during December, we received not much more than a dusting, measuring only a trace on each occasion. On each occasion where we had meaningful precipitation, it fell in the form of rain.

So, what will February bring us, weather-wise? Normally, very cold temperatures and lots of gray, cloudy skies, as it usually one of our more dismal months. Average high temperatures start out in the mid 40s, but are closer to 50 by month's end. Average low temperatures end up around 30 degrees, after starting the month in the upper 20s. This actually sounds better than the weather we've been having December!

There are usually nine days with measurable precipitation during February and two days with measurable snow. We average just over three inches (3.02) of precipitation during the month, and historically, it is our snowiest month, with 3.3 inches of snow the norm.

We have been fortunate so far this winter, to have avoided any major winter storms with the often-accompanying very hazardous driving conditions. Remember to slow down, drive carefully and allow for extra braking distance when the inevitable icy and snowy conditions arrive.

Fauntroy Speaks

Rev. Walter Fauntroy, president of the National Black Leadership Roundtable, spoke Jan. 11 to approximately 100 Wallops employees about Martin Luther King Jr. and the vision Rev. King set forth for the civil rights' movement.

Fauntroy, a former member of Congress representing Washington, D.C., was the Disrict of Columbia coordinator for the historic March on Washington in 1963 and participated in the coordination of the Selma to Montgomery March of 1965 and the Meredith Mississippi Freedom March of 1966

Name That Tune!
Jan. 24 at 6:30 p.m.
Bldg. F-3
with Wallops' own Bob Tittle

Get a team together or just show up, meet new people and form a team. Bring your family, friends and neighbors! Challenge your office mates! Challenge the next-door building occupants!

Name those tunes from the 50's, 60's and 70's. Bring back memories of where you were in 1956! 1964! 1974! Prizes for the winning team.

Degree Conferred

Amy Strong (Fiscal Operations Section) graduated with her Bachelor's Degree on Dec. 17, 2000 from Salisbury State University. She majored in accounting.

Wallops Shorts.....

Balloon Launch

A NASA scientific balloon was successfully launched on Jan 4, 2001, from McMurdo, Antarctica. The 29.47 million cubic foot balloon is carrying a Submillimeter Astrophysic experiment. Principal investigator for this mission is Dr. Edward Cheng, NASA Goddard Space Flight Center. The balloon was still flying on January 16.

The Wallops Black History Club Scholarship Offerred

Academic Achievement Award to one son or daughter of a Wallops employee (NASA , NOAA, SCSC, Coast Guard or Contractor) if:

(S)he has been accepted to an accredited university/college

(S)he is pursuing a degree in science or technology: and

(S)he is submits an application, which includes an essay, by January 26, 2001.

For more information or an application, contact Robert Tittle on x1244, Freda Johnson on x1466 or John Dickerson on x1482.

GSFC Education Summit

Goddard Space Flight Center's Education Council is sponsoring an Education Summit on Jan. 29 in the Building 8 Auditorium. Registration begins at 8:45 a.m. and the Summit ends by 3:30 p.m.

The Summit is designed to provide and exchange information with individuals working in education environments related to effective teaching and learning research, effective teaching models, linkages between education and NASA enterprises, and rules of engagement.

The program is intended for all Center personnel who are involved in K-12 education activities by either job assignment or personal interest. For more information contact the Education Programs Office in Building 28, Room N165 or call 301-286-7205. Register by Jan.22.

If enough Wallops people (more than 5) are interested in attending, Goddard will provide a facilitator at Wallops and the program will be broadcast live at Wallops. Please contact Keith Koehler at x1579 if you are interested in participating.

Inside Wallops is an official publication of Goddard Space Flight Center and is published by the Wallops Office of Public Affairs, Extension 1584, in the interest of Wallops employees.

Editor — Betty Flowers
Printing — Printing Management Office

http://www.wff.nasa.gov